

**CK-12 Foundation**  
**CK-12 Geometry 2<sup>nd</sup> Edition, Geometry**

**Degree of Evidence regarding the Standards for Mathematical Practice:**

**Minimal Evidence**

**Summary of evidence:**

1. **Make sense of problems and persevere in solving them.** In the chapters reviewed, there are little to no open-ended problems. Students are directed in how they should solve a particular problem and then are asked to replicate the process in the practice problems. There is no opportunity for reflection on answers inherent in the resource. There are little to no opportunities for students to make connections among tables, graphs, and equations. Students are sometimes asked to explain their reasoning, but most problems require a numerical answer only. Students are not given the opportunity to develop and implement their own plan to solve the problems. Overall, there are infrequent and limited open-ended problem-solving opportunities for students to tackle on their own. Most problems guide students in exactly how to reach the desired answer. There are very limited opportunities for students to create a problem-solving plan and follow through or determine reasonableness.
2. **Reason abstractly and quantitatively.** In the chapters reviewed, there are very few application problems ingrained in the units. Most problems present the students with a diagram and ask them to solve for  $x$ . Students are asked to apply their reasoning by completing geometric proofs. Students are rarely asked to create a model for an application. Often, symbols just appear in formulas. Students are provided the opportunity to determine reasonableness, and it would be up the teacher to incorporate this skill. Overall, there are very few application problems or examples in this resource. Most questions are solved by applying an algorithm, which the students have not generalized or formed on their own. There is little discussion of reasonableness.
3. **Construct viable arguments and critique the reasoning of others.** In the chapters reviewed, there are limited opportunities for students to explain their reasoning. Problems are mainly focused on arriving at a numerical answer, with the occasional problem requiring an explanation or description. In the chapters reviewed, there is no mention of students sharing their methods with the class. Explanations and discussion of justification are very limited in the chapters reviewed. There are some “Challenge” problems included in student practice that the teacher could use to foster student analysis and justification. There are limited opportunities for students to justify their thinking. Overall, in the chapters reviewed, there are no opportunities for student to analyze errors in order to communicate their understanding. Opportunities will rely on teacher facilitation of the activities and practice problems.
4. **Model with mathematics.** In the chapters reviewed, students are rarely directed to create a model, unless they are completing one of the few investigations present in the text. There is no explicit connection among tables, graphs, equations, and situations in the chapters reviewed. Students have some opportunities to work with tables and equations in the investigations, but these could be skipped. The applications are more in the form of a closed word problem rather than being open-ended. The investigations direct the students in exactly how to complete the investigation and what their results should be, resulting in little motivation for the students to work with the model themselves. Overall, there are some opportunities for students to create mathematical models, but these opportunities depend on teacher implementation and the incorporation of the investigations. Students are presented with how the book details they should solve a problem, and then they are tasked with practicing the use of the prescribed algorithm.
5. **Use appropriate tools strategically.** Geometric constructions seem to be treated as a separate

concept and are sometimes used to help students make sense of later mathematical concepts. Students are taught to use rulers and protractors, and are redirected to use these tools to help them in some of the later investigations. There is no reference to technology present in the text, aside from the mention of using a calculator for problems involving trigonometry. Technology use is limited. Geometric constructions are sometimes used as a tool for students to understand other geometric concepts and properties. In the chapters reviewed, there was little evidence of evaluating the strength and weaknesses of tools.

6. **Attend to precision.** Examples use proper notation and model precision. In the chapters reviewed, examples of precise communication are not present. There is attention to precision in the examples, but no real discussion for students to tackle. The fostering of precise communication would rely on teacher facilitation of the investigations present in the text.
7. **Look for and make use of structure.** In the chapters reviewed, there are few opportunities for students to look at examples and then generalize. The chapters typically give students the formula or concept, shows how to use it, and then gives them practice problems to complete. The investigations guide the students step-by-step to the desired results, which are printed at the conclusion of the investigation. This results in providing little motivation for the students to make and test their own conjectures. There is limited to no connection to prior learning. There are some opportunities for students to generalize their thoughts, but this is primarily after the text has told them the algorithm or rule.
8. **Look for and express regularity in repeated reasoning.** In the chapters reviewed, students are rarely, if ever, asked to look at patterns and generalize on their own. Most of the time, the book shows them the pattern and then provides the formula. There are some investigations interspersed in the chapters, which guide students to analyze and generalize their findings, but the desired formula or rule is immediately given. This prevents students from noticing patterns for themselves. In the chapters reviewed, there are few to no opportunities for students to generalize a pattern to determine a rule. Opportunities to meet this standard would depend on the teacher taking the initiative to incorporate the investigations into the course.